

## Remarks/Arguments

In the Official Action mailed April 10, 2008, the examiner rejected claims 1-6 and 14 under 35 U.S.C. §102(b) over U.S. Patent No. 3,024,191 to Jones. Claims 7-12 are rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 4,071,462 to Matsunaga.

In the present, applicants provide the following distinguishing remarks, which are believed to place the present case in condition for allowance. Favorable reconsideration of all the pending claims is respectfully requested.

## The Invention

In the prior art, it is generally known to make low viscous high solids solution of CMC by alternately adding CMC and hydrogen peroxide to water. This process is rather slow and the additions have to be carried out alternately, i.e., stepwise. Accordingly, the process is rather laborious and time consuming. Further, it is *not possible to add large amount of CMC at once to obtain a high solids content solution since, due to the slow reaction, the viscosity should rise to unacceptable values at which no mixing would be possible.*

The claimed invention is based on the discovery that polysaccharide depolymerization reaction could be greatly accelerated by adding base to the CMC/depolymerization reagent mixture in a single step. In fact, the reaction was so quick that there was no need for the stepwise/alternate addition of CMC and depolymerization reagent to the reaction mixture. Accordingly, the claimed invention relates to a process of making a low viscous solution by dissolving a polysaccharide in water and adding a basic depolymerization reagent or a depolymerization reagent and a base to the reaction mixture, under depolymerization conditions, in a single step.

Claim 1 has been amended to specify that from 2 to 10 wt% of an alkaline depolymerization agent, based on the weight of said polysaccharide or polysaccharide ether, is employed and that the temperature of said aqueous medium is at least 35°C and at most 80°C.

## I. The Rejection of Claims 1-6 and 14 under 35 U.S.C. § 102(b) over Jones.

Jones discloses an aqueous fracturing fluid; he does not disclose the claimed depolymerization process.

The fracturing fluid of Jones is made by first adding CMC to water and subsequently adding a gel breaker, e.g., the perborate to the aqueous solution of CMC (see col. 3, lines 36-39). The perborate and CMC are thus not added simultaneously to the aqueous medium and there is no disclosure of a one-step process as claimed.

The objective of the Jones patent is to initially get a **viscous solution** which can serve as a fracturing liquid (viscosity > 30 cP), which is subsequently and gradually broken down by a gel breaker/depolymerization agent over a **1-24 hour time period**. This gradual breakdown is essential to Jones in that enough time must be given for the composition to be used before the viscosity is seriously reduced (see col. 1, lines 51-56). In contradistinction, the objective of the claimed process is to have the depolymerization occur as quickly as possible to obtain a solution with a viscosity < 1000 mPas = cP. In fact, the depolymerization of the polysaccharide or polysaccharide ether in accordance with the claimed invention takes place after and during dissolution of the polymer in water, and as can be seen from the examples, the viscosities of polysaccharide solutions depolymerized in accordance with the claimed process, after just 15 minutes, are less than 1000 mPas = cP. This is far less than the 30cP (which must be maintained for at least 1 to 24 hours) indicated as desireable by Jones. Thus, it is clear that the claimed process is not the same as the Jones process and one could also conclude that the claimed process would produce a depolymerized product that would have very little practical use in the fracturing method of Jones.

Further, in the Jones patent it is stressed that the composition is essentially neutral (pH between 6 and 8). To obtain a neutral pH it might be necessary to add either acid or base. In claimed process, basic depolymerization agents or a combination of depolymerization agents and bases like caustic soda are employed at concentrations much higher than employed by Jones. In the Jones patent, column 2, line 65-70, it is stated that when high concentrations of perborate are used (about 1 %), the reaction mixture has to be neutralized to get the desired result. High base concentration is

employed in the claimed process (i.e., 2 to 10 wt% of an alkaline depolymerization agent, based on the weight of said polysaccharide or polysaccharide ether) to accelerate the breaking down of the polysaccharide ether. The present examples also illustrate that applicants are using much more perborate and there is no need to neutralize the solutions.

Finally, the temperature of the aqueous medium in the claimed process for said simultaneous addition is at least at least 35°C and at most 80°C. Jones does not disclose simultaneous addition at these temperatures.

In view of the foregoing applicants respectfully submit that claims 1-6 and 14 are clearly not anticipated by Jones; reconsideration and withdrawal of the subject rejection is respectfully requested.

## II. The Rejection of Claims 7-12 under 35 U.S.C. § 102(b) over Matsunaga.

Matsunaga discloses a process for the preparation of sodium percarbonate or perborate. In the process, a powdery detergent is blended with a small amount of carboxymethylcellulose by granulation. The resulting granulated product in, for example, Example 1, contains 0.0003 parts carboxymethylcellulose on 1 part sodium percarbonate, i.e., the amount of sodium percarbonate is extremely high compared to the amount of carboxymethylcellulose. The composition of Matsunaga is not suitable for the preparation of aqueous solutions of low molecular weight polysaccharide ethers with high solids content as compositions according to the invention contain, comparatively speaking, low amounts of alkaline depolymerization agent based on the total amount of carboxymethylcellulose.

In support of the rejection the examiner states that applicants' argument  
“is not persuasive since the instant claims do not recite a specific amount of alkaline depolymerization agent (i.e., sodium percarbonate) that may be present in the instantly claimed solid composition.”

The examiner is respectfully directed to note that claim 7 has been amended to delineate the amount of alkaline depolymerization agent in the claimed solid composition. This amount, i.e., 2 to 10 wt% of an alkaline depolymerization agent, based on the weight of

said polysaccharide or polysaccharide ether, is far less than what is disclosed by Matsunaga. In view of the foregoing, applicants respectfully submit that one of ordinary skill in the art would not view Matsunaga as anticipating the claimed invention. The present rejection is therefore believed to be improper; reconsideration and withdrawal thereof is respectfully solicited.

Therefore, in view of the amendments and remarks herein, the present claims are believed to be in condition for allowance, which action is respectfully solicited.

Respectfully submitted,



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